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Attorney Docket No. 2003P14602US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Inventor:	P. Ditzel et al.	Group Art Unit: 1793
Serial No.:	10/679,080	Examiner: Michael Aboagye
Filed:	October 4, 2003	Confirmation No.: 3519

Title: CONSUMABLE INSERT AND METHOD OF USING THE SAME

Mail Stop Appeal Brief - Patent
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

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This cover sheet (1 page)
Fee Transmittal (1 page)
Appellant's Brief under 37 CFR 41.37 (19 pages)

David G. Maire 3/8/2008

David G. Maire, Reg. No. 34,865 Date

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FEE TRANSMITTAL
For FY 2008

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 510.00

Complete if Known	
Application Number	10/679,080
Filing Date	10/04/2003
First Named Inventor	Peter J. Ditzel
Examiner Name	Michael Aboagye
Art Unit	1793
Attorney Docket No.	2003P14602US

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): ____________

☑ Deposit Account Deposit Account Number: Siemens Corp Deposit Account Name: 19-2179

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☑ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	Fee ($)	Small Entity Fee ($)	Fee ($)	Small Entity Fee ($)	Fee ($)	Small Entity Fee ($)	Fees Paid ($)
Utility	310	155	510	255	210	105	
Design	210	105	100	50	130	65	
Plant	210	105	310	155	160	80	
Reissue	310	155	510	255	620	310	
Provisional	210	105	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	210	105
Multiple dependent claims	370	185

Total Claims ______ - 20 or HP = Extra Claims ______ x Fee ($) ______ = Fee Paid ($) ______
HP = highest number of total claims paid for, if greater than 20

Multiple Dependent Claims
Fee ($) ______ Fee Paid ($) ______

Indep. Claims ______ - 3 or HP = Extra Claims ______ x Fee ($) ______ = Fee Paid ($) ______
HP = highest number of independent claims paid for, if greater than 3

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $260 ($130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets ______ - 100 = Extra Sheets ______ / 50 = Number of each additional 50 or fraction thereof ______ (round up to a whole number) x Fee ($) ______ = Fee Paid ($) ______

4. OTHER FEE(S) Fees Paid ($)

Non-English Specification, $130 fee (no small entity discount) ______

Other (e.g., late filing surcharge): Filing a Brief in Support of Appeal 37 CFR 41.20(b)(2) $510.00

SUBMITTED BY					
Signature	Erik C. Swanson	Registration No. (Attorney/Agent)	40,194	Telephone	407-736-5602
Name (Print/Type)				Date	

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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SIEMENS

PATENT

Attorney Docket No. 2003P14602US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Inventor:	P. Ditzel et al.	)	Group Art Unit:	1793
		)		
Serial No.:	10/679,080	)	Examiner:	Michael Aboagye
		)		
Filed:	October 4, 2003	)	Confirmation No.	3519

Title: CONSUMABLE INSERT AND METHOD OF USING THE SAME

Mail Stop Appeal Brief - Patent
COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPELLANT'S BRIEF UNDER 37 CFR 41.37

This brief is in furtherance of the Notice of Appeal filed in this application on 09 January 2008. A Fee Transmittal form PTO/SB/17 is transmitted concurrently with this paper to authorize the payment of the fee required for submittal of this brief.

1. REAL PARTY IN INTEREST - 37 CFR 41.37(c)(1)(i)

The real party in interest in this Appeal is the assignee Siemens Power Generation, Inc.

2. RELATED APPEALS AND INTERFERENCES - 37 CFR 41.37(c)(1)(ii)

There is no other appeal, interference or judicial proceeding that is related to or that will directly affect, or that will be directly affected by, or that will have a bearing on the Board's decision in this Appeal.

3. STATUS OF CLAIMS - 37 CFR 41.37(c)(1)(iii)

Claims pending: 1-4, 7-9, 12 and 15-22
Claims cancelled: 5, 6, 10, 11, 13, 14, 23 and 24
Claims withdrawn but not cancelled: None
Claims allowed: None
Claims objected to: None
Claims rejected: 1-4, 7-9, 12 and 15-22

The claims on appeal are 1-4, 7-9, 12 and 15-22.

4. STATUS OF AMENDMENTS - 37 CFR 41.37(c)(1)(iv)

An amendment was filed after the final rejection under 37 CFR 1.116 on 07 January 2008 That amendment attempted to resolve the pending rejections under 35 USC 112, first and second paragraphs, by changing "comprising nickel-boron" to "comprising boron" in claim 1. This change was in accordance with a previous statement by the Examiner that, while there was no support in the application for a melting point depressant comprising nickel-boron, there is support for a melting point depressant such as boron. However, the Examiner refused to enter the amendment, thus maintaining the Section 112 rejections in this appeal.

5. SUMMARY OF THE CLAIMED SUBJECT MATTER- 37 CFR 41.37(c)(1)(v)

This invention relates generally to a consumable insert 10, as illustrated in FIG. 2, that may be used in a bonding process.

Independent claim 1 is directed to a consumable insert foil 10 of FIG. 2 as described in the specification at page 3, lines 1-5. The foil comprises a metal-comprising material 12 and melting point depressant material 14, the melting point depressant material comprising nickel-boron having a concentration C (as shown in Fig. 3) that is greater proximate a center region 16 of the consumable insert foil than proximate an exterior surface region 18 of the consumable insert foil.

Independent claim 7 is directed to a consumable insert 10 comprising a sheath 12 having a desired ribbon shape; and particles 14 of an MCrAlY alloy material exhibiting a ductility of less than 18% tensile elongation contained by the sheath, as described at page 5, line 31 through page 6, line 5.

Independent claim 15 is directed to a method of transient liquid phase bonding using a consumable insert 10, as described at page 4, line 28 through page 5, line 6. The method comprises forming a consumable insert 10 comprising a metal-comprising material 12 and melting point depressant material 14, the melting point depressant material having a melting point depressant concentration C (FIG. 3) that is greater proximate a center region 16 of the insert than proximate an exterior surface region 18 of the insert. The method further comprises capturing the consumable insert between two work pieces to be joined by transient liquid phase bonding; heating the work pieces and the consumable insert to a temperature sufficiently high to melt the consumable insert; and maintaining the temperature sufficiently high for the melting point depressant to diffuse into the work pieces to an extent sufficient for the consumable insert to solidify to form a joint between the work pieces: wherein forming the consumable insert further comprises depositing particles of the melting point depressant 14 into a hollow center of a tube of sheath material 12; and flattening the tube into a ribbon shape 10 having the particles 14 of the melting point depressant in the center region 16 and having the sheath material 12 in the exterior surface region 18, as described in the specification at page 4, lines 13-16.

Independent claim 18 is directed to a method of transient liquid phase bonding using a consumable insert 10, the method comprising: forming a consumable insert 10 comprising a metal-comprising material 12 and melting point depressant material 14, the melting point depressant material having a melting point depressant concentration C (FIG. 3) that is greater proximate a center region 16 of the insert than proximate an exterior surface region 18 of the insert; capturing the consumable insert between two work pieces to be joined by transient liquid phase bonding; heating the work pieces and the consumable insert to a temperature sufficiently high to melt the consumable insert; and maintaining the temperature sufficiently high for the melting point depressant to diffuse into the work pieces to an extent sufficient for the consumable insert to solidify to form a joint between the work pieces. The method of claim 18 further comprises forming the consumable insert by depositing particles 14 of the melting point depressant into a U-shaped plate of sheath material; forming the U-shaped plate into a tube; and flattening the tube into a ribbon shape 10 having the particles of the melting point depressant in the center region 16 and having the sheath material 12 in the exterior surface region 18, as described in the specification at page 3, line20 through page 4, line 3.

Independent claim 19 is directed to a method of transient liquid phase bonding using a consumable insert 10, the method comprising: forming a consumable insert 10 comprising a metal-comprising material 12 and melting point depressant material 14, the melting point depressant material having a melting point depressant concentration C (FIG. 3) that is greater proximate a center region 16 of the insert than proximate an exterior surface region 18 of the insert; capturing the consumable insert between two work pieces to be joined by transient liquid phase bonding; heating the work pieces and the consumable insert to a temperature sufficiently high to melt the consumable insert; and maintaining the temperature sufficiently high for the melting point depressant to diffuse into the work pieces to an extent sufficient for the consumable insert to solidify to form a joint between the work pieces. The method of claim 19 further comprises depositing particles 14 of the melting point depressant onto a lower plate 12 of sheath material; covering the particles with an upper plate 12 of sheath material; and flattening the upper and lower plates together to a desired thickness T (FIG. 2) to form the consumable insert 10, as described in the specification at page 4, lines 4-12.

Independent claim 22 is directed to a method of material deposition utilizing a consumable insert 10, the method comprising: providing a consumable insert 10 comprising a sheath 12 formed to a desired ribbon shape and particles of an MCrAlY alloy material 14 contained by the sheath; and melting the insert onto a surface of a work piece; and allowing the melt to cool to form a coating, as described in the specification at page 5, line 11 through page 6, line 7.

(Please proceed to the next page.)

6. GROUNDS OF REJECTION TO BE REVIEWED UPON APPEAL - 37 CFR 41.37(c)(1)(vi)

A. Claims 1-4 stand rejected under 35 USC 112, first paragraph.

B. Claims 1-4 stand rejected under 35 USC 112, second paragraph.

C. Claim 1 stands rejected under 35 USC 102(b) as being anticipated by Cairo.

D. Claims 1-4 stand rejected under 35 USC 102(b) as being anticipated by Ryan.

E. Claims 7-9 and 12 stand rejected under 35 USC 103(a) as being unpatentable over Ryan in view of Sabol.

F. Claims 15-21 stand rejected under 35 USC 103(a) as being unpatentable over Ryan in view of Bampton.

G. Claim 22 stands rejected under 35 USC 103(a) as being unpatentable over Ryan in view of Bampton and Sabol.

7. ARGUMENT 37 CFR 41.37(c)(1)(vii)

A. The Examiner maintains that the claim 1 limitation of "melting point depressant material comprising nickel-boron" is not supported in the specification, and therefore claims 1-4 are rejected under 35 USC 112, first paragraph. The Examiner admits that there is support for boron as a melting point depressant, and the Appellant attempted to amend "nickel-boron" to "boron" in an amendment after final rejection. However, the Examiner refused to enter that amendment in spite of the fact that boron as the melting point depressant had already been examined as a limitation of claim 17. Thus, the Appellant offers the following argument.

Page 4, lines 17-22 of the specification clearly describes an embodiment where a consumable insert is heated to encourage diffusion of boron melting point depressant into a nickel sheath material to form nickel-boron. Thus, the claim 1 limitation of a "melting point depressant material comprising nickel-boron" is fully supported in the specification, and the rejection under 35 USC 112, first paragraph should be reversed.

B. Claims 1-4 stand rejected under 35 USC 112, second paragraph, due to the limitation of "melting point depressant material comprising nickel-boron." Page 4, lines 17-22 of the specification clearly describes an embodiment where a consumable insert is heated to encourage diffusion of boron melting point depressant into a nickel sheath material to form nickel-boron. Accordingly, the claim 1 limitation of a "melting point depressant material comprising nickel-boron" can be fully understood in view of the specification, and claim 1 serves to particularly point out and distinctly claim the subject matter which the Appellant regards as the invention. Thus, the rejection under 35 USC 112, first paragraph should be reversed.

C. Claim 1 stands rejected under 35 USC 102(b) as being anticipated by Cairo. Claim 1 includes the limitations of "a consumable insert foil comprising ... the melting point depressant material ... having a concentration that is greater proximate a center region of the consumable insert than proximate an exterior surface region of the consumable insert." In contrast, Cairo contains no description of such a varying concentration of melting point material in a foil and therefore the rejection under 35 USC 102 is not supported by the art.

Column 3, lines 51-54 of Cairo states

"The interlayer foil 16 preferably comprises a low melting point, prealloyed foil having a eutectic composition, or near eutectic composition, throughout its thickness."

Cairo also states at column 6, lines 37-40 that

"at the instant of melting, the concentration of boron in the melted region is uniform through the thickness of the foil being melted."

Thus, Cairo teaches away from the consumable insert of claim 1 which has a graduated concentration of melting point depressant.

The Examiner basis this rejection upon column 5, lines 1-5 and 30-37 of Cairo where Cairo describes the diffusion of boron through the melted foil material and into the metal members being joined after melting of the foil. After the foil has melted, the boron diffuses and the concentration of boron becomes graduated, remaining highest at the center "of the melted joint." (Cairo column 6, lines 42-44) Thus, the Examiner is basing the rejection of claim 1 on the chemistry conditions of the melted joint, whereas claim 1 is directed to a consumable insert foil as it exists prior to its incorporation into a melted joint. This is like comparing apples to oranges. It is the foil of Cairo, not the melted pool of metal, which must anticipate the foil of claim 1. If the Examiner relies upon the melted metal joint of Cairo, then Cairo lacks a foil and thus lacks the claimed "exterior surface region of the consumable insert foil" since the foil and a small surface region of the joined metal members 12, 14 are melted and become the pool of liquid metal in the joint region. The Examiner can not have it both ways - Cairo teaches a foil with a uniform distribution of boron, and he teaches a melted pool of metal with a gradient concentration of boron; but Cairo does not teach a consumable insert foil with a gradient concentration of boron.

Thus, Cairo fails to anticipate claim 1 and the rejection under 35 USC 102 should be reversed.

D. Claims 1-4 stand rejected under 35 USC 102(b) as being anticipated by Ryan. Independent claim 1 and therefore each of the dependent claims 2-4 include the limitations of "a consumable insert foil comprising ... the melting point depressant material ... having a concentration that is greater proximate a center region of the consumable insert than proximate an exterior surface region of the consumable insert." Ryan describes the use of multiple foils (see column 1, line 53) wherein each foil has a boronized surface (column 2, line 37); i.e. a higher concentration of boron near the surface of the foil than in the center of the foil. Thus, each individual foil of Ryan teaches away from the limitations of claims 1-4.

The Examiner basis this rejection on the fact that Ryan describes the use of two such foils in a stack. However, even the stacked foils of Ryan do not anticipate claims 1-4 because the concentration of boron in the stack is the same in the upper, middle and bottom regions. The Examiner has failed to appreciate that "concentration" is a measure of boron per unit volume. Each individual foil of Ryan has the same concentration of boron on its top and bottom surfaces, so when two foils are stacked, the middle area still has the same "concentration" of boron, i.e. amount of boron per unit volume. While it is true that the two facing surfaces of the two stacked foils provide twice the "content" of boron (total molecules of boron), there is also twice the amount of metal (metal bottom of top foil, and metal top of bottom foil) so the concentration of boron per unit volume is the same in the middle of the stack as it is in the top and bottom regions. Thus, the rejections of claims 1-4 under 35 USC 102 are not supported by the art and should be reversed.

E. Claims 7-9 and 12 stand rejected under 35 USC 103(a) as being unpatentable over Ryan in view of Sabol. Independent claim 7 (and thus each of its dependent claims 8, 9 and 12) is directed to "A consumable insert comprising: a sheath having a desired ribbon shape; and particles of an MCrAlY alloy material exhibiting a ductility of less than 18% tensile elongation contained by the sheath."

Ryan describes a consumable insert but lacks any teaching of the use of MCrAlY material. Sabol describes a protective coating of MCrAlY material deposited on a metal substrate wherein particles of boron in the MCrAlY material allow the coating to condense to form a more densified coating. (Sabol column 3, lines 55-58) The Examiner states that it would have been obvious to use the MCrAlY material of Sabol in the insert of Ryan, thereby rejecting claims 7-9 and 12 under 35 USC 103. However, the Examiner errs in his interpretation of the teaching of Sabol and he has failed to establish a *prima facie* case for obviousness, as follows.

First, the Examiner interprets Sabol as teaching a "transient liquid phase consumable insert made of MCrAlY alloy material…for joining nickel based alloys…" To the contrary, Sabol lacks any teaching of a consumable insert for making a metal joint - rather, he teaches an MCrAlY coating 14 for the protection of an underlying metal substrate 12. Sabol contains no teaching of a "consumable insert" in the sense that such term is used in the present specification and in the art of joining of materials. The MCrAlY coating 14 of Sabol is deposited onto the surface 22 of the substrate 12, and the boron content of the coating allows it to densify upon heating. The MCrAlY coating is applied to the surface of the metal substrate 12 in any conventional manner, such as thermal spray, powder slurry, slurry spray, electrophoretic coating or electrostatic powder coating, as described at column 3, lines 12-19. While the present claims 7-9 and 12 are directed to a novel consumable insert that provides a new mechanism for depositing brittle MCrAlY material, Sabol is not even concerned about how to deposit the MCrAlY material, but rather only how to condense it after deposition. Thus, the Examiner uses an erroneous interpretation of Sabol as being directed to a consumable insert as the motivation for combining the teachings of Sabol and Ryan. This fails to establish a *prima facie* case for obviousness because the Examiner has demonstrated no basis for why one skilled in the art would combine the teaching of Sabol regarding sprayed protective surface coatings into the teaching of Ryan regarding consumable inserts for joining two metals.

Second, the combination of the MCrAlY of Sabol into the consumable insert of Ryan would destroy the functionality of the Ryan insert. The Federal Circuit has consistently held that a modification of a reference that destroys the intent, purpose or function of the invention disclosed in the reference is not proper. Here, the addition of MCrAlY alloy material of Sabol in the consumable insert of Ryan would not lower but rather would raise the melting temperature of the insert, thereby destroying its functionality as a low melting temperature consumable insert for forming transient liquid phase joints as desired by Ryan. The present inventors have innovatively identified an alternative use for their consumable insert which was not previously recognized in the art. Not only can the inventors consumable insert be used for making joints in certain embodiments, as described beginning at page 5, line 11 of the present specification, the present inventors have recognized that the claimed consumable insert is also useful for the deposition of non-ductile materials such as MCrAlY. The increase of melting temperature is not problematic in such a material deposition embodiment. It is this aspect of the invention that is claimed in claims 7-9 and 12.

The Examiner argues on page 8 of the Final Rejection that "It is noted that, Ryan modified by Sabol et al. only substitutes the nickel boron foil for MCrAlY." However, it is impossible to substitute MCrAlY for nickel boron when making a foil, because MCrAlY is too brittle to be made into a foil shape, as discussed in the present specification at page 1, lines 14-17 and page 5, lines 11 through page 6, line 21. Here, again, the Examiner has expressed an erred interpretation of the prior art that has allowed him to infer a motivation to combine when none actually exists.

Since no *prima facie* support for the proposed combination of references has been established, reversal of the rejections of claims 7-9 and 12 is appropriate.

F. Claims 15-21 stand rejected under 35 USC 103(a) as being unpatentable over Ryan in view of Bampton. Each of these method claims includes the limitations of "forming a consumable insert comprising a metal-comprising material and melting point depressant material, the melting point depressant material having a melting point depressant concentration that is greater proximate a center region of the insert than proximate an exterior surface region of the insert." The various claims also include other limitations related to the process for forming the consumable insert so as to achieve the desired gradient in the concentration of the melting point depressant material.

The combination of Ryan and Bampton fails to provide *prima facie* support for the rejection of any of claims 15-21 because the combination lacks essential elements of each of these claims, as describe below.

First, as discussed in paragraph D above, the Examiner here again mistakenly interprets Ryan as teaching a foil insert having a concentration of melting point depressant that is greater at the center of the insert than proximate an exterior surface region of the insert. As discussed in paragraph D, each individual foil insert of Ryan has the opposite concentration gradient, with more boron near its surfaces than in its center. Furthermore, the stack of two foil inserts taught by Ryan only doubles the content of boron in the center of the stack, but the concentration of the boron remains the same as in the top and bottom regions, since concentration is a "per unit volume" measurement. Stacking two foils of X% concentration provides twice as much boron but it also provides twice as much surrounding metal, so the concentration at the center of the stack is still X%. Bampton fails to correct this shortcoming of the primary Ryan reference, thus, the combination lacks this essential limitation and no *prima facie* case for obviousness has been established.

Furthermore, the combination of Ryan and Bampton fails to teach other essential limitations of the various rejected claims. In particular, there is no teaching of the flattening of a tube as in claims 15-17, or the flattening of a U-shaped plate as in claim 18, or the flattening of upper and lower plates together to a desired thickness after depositing particles there between of claims 19-21, or the sealing of adjoining edges of upper and lower plates together to capture particles there between prior to flattening of claim 20. These limitations are directed to the steps of forming the insert to achieve the concentration gradient before it is used to form the joint, but the Examiner seems to be confusing these steps with the shape of the insert in its final form as it is being used to make the joint. The Appellant made note of such shortcomings of the art in the response filed under 37 CFR 1.111 on 18 July 2007; however, in spite of the requirement of MPEP 707.07(f) that that the Examiner is to answer the substance of applicant's arguments, the Examiner did not even address this flaw in the rejections in his Response to Arguments the final Office Communication dated 09 October 2007.

Since the combination of Ryan and Bampton lacks essential elements of each of the rejected claims 15-21, reversal of these rejections is appropriate.

G. Claim 22 stands rejected under 35 USC 103(a) as being unpatentable over Ryan in view of Bampton and Sabol. Claim 22 is directed to a "method of material deposition utilizing a consumable insert" where the type of insert is like that of apparatus claims 7-9 and 12 discussed in paragraph E above. The claim 22 method comprises: "providing a consumable insert comprising a sheath formed to a desired ribbon shape and particles of an MCrAlY alloy material contained by the sheath; and melting the insert onto a surface of a work piece; and allowing the melt to cool to form a coating."

The method of utilizing a consumable insert of Ryan lacks any teaching of MCrAlY and the Examiner admits that Bampton also fails to teach anything about MCrAlY. The Examiner then misinterprets the teaching of Sabol and erroneously concludes that it would have been obvious to combine Sabol with the primary references to achieve the method of claim 22.

First, Sabol describes a protective coating of MCrAlY material deposited on a metal substrate wherein particles of boron in the MCrAlY material allow the coating to condense to form a more densified coating. (Sabol column 3, lines 55-58) The Examiner misinterprets Sabol as teaching a "transient liquid phase consumable insert made of MCrAlY alloy material...for joining nickel based alloys..." To the contrary, Sabol lacks any teaching of a consumable insert for making a metal joint - rather, he teaches an MCrAlY coating 14 for the protection of an underlying metal substrate 12. Sabol contains no teaching of a "consumable insert" in the sense that such term is used in the present specification and in the art of joining of materials. The MCrAlY coating 14 of Sabol is deposited onto the surface 22 of the substrate 12, and the boron content of the coating allows it to densify upon heating. The MCrAlY coating is applied to the surface of the metal substrate 12 in any conventional manner, such as thermal spray, powder slurry, slurry spray, electrophoretic coating or electrostatic powder coating, as described at column 3, lines 12-19. While the present claim 22 is directed to a novel method for depositing brittle MCrAlY material, Sabol is not even concerned about how to deposit the MCrAlY material, but rather only how to condense it after deposition. Thus, the Examiner uses an erroneous interpretation of Sabol as being directed to a consumable insert as the motivation for combining the teachings of Sabol with that of Ryan. This fails to establish a *prima facie* case for obviousness because the Examiner has demonstrated no basis for why one skilled in the art would combine the teaching of Sabol regarding sprayed protective surface coatings into the teaching of Ryan regarding consumable inserts for joining two metals. The Bampton reference adds nothing to correct this deficiency in the art.

Second, the combination of the MCrAlY of Sabol into the consumable insert of Ryan would destroy the functionality of the Ryan insert. The Federal Circuit has consistently held that a modification of a reference that destroys the intent, purpose or function of the invention disclosed in the reference is not proper. Here, the addition of MCrAlY alloy material of Sabol in the consumable insert of Ryan would not lower but rather would raise the melting temperature of the insert, thereby destroying its functionality as a low melting temperature consumable insert for forming transient liquid phase joints as desired by Ryan. The present inventors have innovatively identified an alternative use for their consumable insert which was not previously recognized in the art. Not only can the inventors consumable insert be used for making joints in certain embodiments, as described beginning at page 5, line 11 of the present specification, the present inventors have recognized that the claimed consumable insert is also useful for the deposition of non-ductile materials such as MCrAlY. The increase of melting temperature is not problematic in such a material deposition embodiment. It is this aspect of the invention that is claimed in claim 22.

The Examiner argues on page 8 of the Final Rejection that "It is noted that, Ryan modified by Sabol et al. only substitutes the nickel boron foil for MCrAlY." However, it is impossible to substitute MCrAlY for nickel boron when making a foil, because MCrAlY is too brittle to be made into a foil shape, as discussed in the present specification at page 1, lines 14-17 and page 5, lines 11 through page 6, line 21. Here, again, the Examiner has expressed an erred interpretation of the prior art that has allowed him to infer a motivation to combine when none actually exists.

Since no *prima facie* support for the proposed combination of references has been established, reversal of the rejection of claim 22 is appropriate.

8. CLAIMS APPENDIX - 37 CFR 41.37(c) (1) (viii).

A copy of the claims involved in this appeal is attached as a claims appendix under 37 CFR 41.37(c) (1) (viii).

9. EVIDENCE APPENDIX - 37 CFR 41.37(c) (1) (ix)

None is required under 37 CFR 41.37(c) (1) (ix).

10. RELATED PROCEEDINGS APPENDIX - 37 CFR 41.37(c) (1) (x)

None is required under 37 CFR 41.37(c) (1) (x).

Respectfully submitted,

Dated: 3/8/2008

By: David G. Maire

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APPENDIX OF CLAIMS ON APPEAL

1. A consumable insert foil comprising a metal-comprising material and melting point depressant material, the melting point depressant material comprising nickel-boron having a concentration that is greater proximate a center region of the consumable insert foil than proximate an exterior surface region of the consumable insert foil.

2. The consumable insert foil of claim 1, further comprising an upper layer of a sheath material opposed a lower layer of a sheath material and the melting point depressant contained there between.

3. The consumable insert foil of claim 2, wherein the upper layer and lower layers have been mechanically pressed together to provide the insert with a desired cross-sectional thickness.

4. The consumable insert foil of claim 2, wherein the sheath material comprises nickel.

7. A consumable insert comprising:
a sheath having a desired ribbon shape; and
particles of an MCrAlY alloy material exhibiting a ductility of less than 18% tensile elongation contained by the sheath.

8. The consumable insert of claim 7, wherein the material exhibits a ductility of less than 15% tensile elongation.

9. The consumable insert of claim 7, wherein the material exhibits a ductility of less than 10% tensile elongation.

12. The consumable insert of claim 7, wherein the sheath comprises nickel.

15. A method of transient liquid phase bonding using a consumable insert, the method comprising:

forming a consumable insert comprising a metal-comprising material and melting point depressant material, the melting point depressant material having a melting point depressant concentration that is greater proximate a center region of the insert than proximate an exterior surface region of the insert;

capturing the consumable insert between two work pieces to be joined by transient liquid phase bonding;

heating the work pieces and the consumable insert to a temperature sufficiently high to melt the consumable insert; and

maintaining the temperature sufficiently high for the melting point depressant to diffuse into the work pieces to an extent sufficient for the consumable insert to solidify to form a joint between the work pieces,

wherein forming the consumable insert further comprises:

depositing particles of the melting point depressant into a hollow center of a tube of sheath material; and

flattening the tube into a ribbon shape having the particles of the melting point depressant in the center region and having the sheath material in the exterior surface region.

16. The method of claim 15, further comprising selecting the sheath material to comprise nickel.

17. The method of claim 16, further comprising selecting the melting point depressant to comprise one of the group of boron, nickel and phosphorous.

18. A method of transient liquid phase bonding using a consumable insert, the method comprising:

forming a consumable insert comprising a metal-comprising material and melting point depressant material, the melting point depressant material having a melting point depressant concentration that is greater proximate a center region of the insert than proximate an exterior surface region of the insert;

capturing the consumable insert between two work pieces to be joined by transient liquid phase bonding;

heating the work pieces and the consumable insert to a temperature sufficiently high to melt the consumable insert; and

maintaining the temperature sufficiently high for the melting point depressant to diffuse into the work pieces to an extent sufficient for the consumable insert to solidify to form a joint between the work pieces,

wherein forming the consumable insert further comprises:

depositing particles of the melting point depressant into a U-shaped plate of sheath material;

forming the U-shaped plate into a tube; and

flattening the tube into a ribbon shape having the particles of the melting point depressant in the center region and having the sheath material in the exterior surface region.

19. A method of transient liquid phase bonding using a consumable insert, the method comprising:

forming a consumable insert comprising a metal-comprising material and melting point depressant material, the melting point depressant material having a melting point depressant concentration that is greater proximate a center region of the insert than proximate an exterior surface region of the insert;

capturing the consumable insert between two work pieces to be joined by transient liquid phase bonding;

heating the work pieces and the consumable insert to a temperature sufficiently high to melt the consumable insert; and

maintaining the temperature sufficiently high for the melting point depressant to diffuse into the work pieces to an extent sufficient for the consumable insert to solidify to form a joint between the work pieces,

wherein forming the consumable insert further comprises:

depositing particles of the melting point depressant onto a lower plate of sheath material;

covering the particles with an upper plate of sheath material; and

flattening the upper and lower plates together to a desired thickness to form the consumable insert.

20. The method of claim 19, further comprising sealing adjoining edges of the upper plate and the lower plate together to capture the particles there between prior to the step of flattening.

21. The method of claim 19, further comprising subjecting the consumable insert to a diffusion heat treatment regiment prior to the step of heating.

22. A method of material deposition utilizing a consumable insert, the method comprising:

providing a consumable insert comprising a sheath formed to a desired ribbon shape and particles of an MCrAlY alloy material contained by the sheath; and

melting the insert onto a surface of a work piece; and

allowing the melt to cool to form a coating.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.